

Properties of Exponents

$$\textcircled{1} a^m \cdot a^n = a^{m+n}$$

$$\textcircled{2} \frac{a^m}{a^n} = a^{m-n}$$

$$\textcircled{3} (a^m)^n = a^{mn}$$

$$\textcircled{4} a^{-n} = \frac{1}{a^n}$$

$$\frac{\cancel{2} \cdot \cancel{3} \cdot \cancel{3}}{\cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot 3 \cdot 3}$$

$$\textcircled{5} (ab)^n = a^n b^n$$

$$\textcircled{6} \left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$\textcircled{7} \left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n$$

$$\textcircled{8} a^0 = 1$$

$$\textcircled{9} a^{\frac{m}{n}} = \sqrt[n]{a^m} \text{ or } (\sqrt[n]{a})^m$$

if m is neg., $a \neq 0$

$$4^{\frac{1}{2}} = \sqrt[2]{4} = 2$$

$$\sqrt[7]{16} = 16^{\frac{1}{7}}$$

$$8^{\frac{1}{3}} = \sqrt[3]{8} = 2$$

$$8^{\frac{2}{3}} = \left(\sqrt[3]{8}\right)^2 \text{ or } \sqrt[3]{8^2} = 4$$

$$625^{\frac{1}{4}} = \sqrt[4]{625} = 5$$

$$625^{\frac{3}{4}} = \left(\sqrt[4]{625}\right)^3 \text{ or } \sqrt[4]{625^3} = 125$$

$$32^{\frac{1}{5}} = \sqrt[5]{32}$$

$$4^{\frac{3}{2}} = \left(\sqrt{4}\right)^3 \text{ or } \sqrt{4^3} = 8$$

Write as a root

$$\textcircled{a} \quad 7^{3/2} = \sqrt{7^3} \text{ or } (\sqrt{7})^3 = \sqrt{7 \cdot 7 \cdot 7} = 7\sqrt{7}$$

$$\textcircled{b} \quad 81^{3/4} = \sqrt[4]{81^3} \text{ or } (\sqrt[4]{81})^3 = 27$$

$$\textcircled{c} \quad 625^{-1/4} = \frac{1}{\sqrt[4]{625}} = \frac{1}{5}$$

$$\textcircled{d} \quad (16y^{-8})^{-3/4} = 16^{-3/4} y^6 = \frac{1}{\sqrt[4]{16^3}} \cdot y^6 = \frac{y^6}{\sqrt[4]{16^3}} = \frac{y^6}{8}$$

① Sect. 7.4

#1-7, 10-14, 18-21, 30-33, 38, 39, 46-48, 69-70

② HW

p. 384 #63-70 (5)

p. 390 #97-102